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### REMARKS

This response is intended as a full and complete response to the Office Action dated July 29, 2004. In view of the following discussion, the Applicants believe that all claims are in allowable form.

### **CLAIM REJECTIONS**

#### **I. 35 U.S.C. §112 Claims 6-8, 13, 14, and 16-18**

Claims 6-8, 13-14, and 16-19 stand rejected under 35 U.S.C. §112. In response, the Applicants have amended claim 13 to more clearly recite aspects of the invention.

Claims 6-8 and 16-19 have been cancelled without prejudice. As such, the rejection is moot and should be withdrawn with respect to these claims. The Applicants reserve the right to pursue the cancelled subject matter in continuing applications.

Thus, the Applicants submit that claims 13-14 are in allowable form. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

#### **II. DOUBLE PATENTING Claims 4, 9, 21, and 25**

Claim 4 is objected to as being a substantial duplicate of claim 21. Claim 9 is objected to as being a substantial duplicate of claim 25. In response the Applicants have amended claims 21 and 25 to more clearly recite aspects of the invention.

As such, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

#### **III. 35 U.S.C. §102**

##### **A. 35 U.S.C. §102(e) Claims 1-3**

Claims 1-3 stand rejected as being anticipated by United States Patent No. 6,307,242, issued October 23, 2001, to Sugiyama (hereinafter *Sugiyama*). In response, the Applicants have amended claim 1 to more clearly recite aspects of the invention.

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Claim 1 recites limitations not taught or suggested by *Sugiyama*. *Sugiyama* does not teach or suggest depositing a core material on said first insulating layer to fill said opening, wherein said core material contacts said semiconductor layer along a side of said opening, as recited by claim 1. Therefore, *Sugiyama* does not teach or suggest all of the limitations of independent claim 1 and all claims depending therefrom.

Thus, the Applicants submit that claims 1-3 are patentable over *Sugiyama*. Accordingly, the Applicants respectfully request the rejection be withdrawn and the claims allowed.

#### IV. 35 U.S.C. §103(a)

##### A. Claims 4, 13, and 21

Claims 4, 13, and 21 stand rejected as being unpatentable over *Sugiyama* in view of United States Patent No. 6,553,170, issued April 22, 2002, to Zhong et al. (hereinafter *Zhong*). In light of amended claim 1, the Applicants respectfully disagree.

As discussed above, amended claim 1, from which claim 13 depends, recites limitations not taught or suggested by *Sugiyama*. *Zhong* discloses a method of forming an optical waveguide by etching away core material deposited on an upper surface of a substrate and subsequently covering the core material and substrate with a top cladding layer. (*Zhong*, col. 4, l. 65 – col. 5, l. 10.) Thus, *Zhong* fails to teach or suggest a modification to the fabrication method of *Sugiyama* wherein said core material contacts said semiconductor layer along a side of said opening, as recited by claim 1. As such, a *prima facie* case of obviousness has not been established since the combination of the cited art fails to teach or suggest all of the limitations recited in claim 1.

Moreover, *Sugiyama* requires the presence of a Si/SiGe layer or a Ge layer as a light absorption layer on both walls of the optical waveguide. (*Sugiyama*, col. 4, ll. 36-47.) Thus, *Sugiyama* may not be modified in a manner that would yield the invention as recited in claim 1, as any such modification would render *Sugiyama* unsuitable for its intended purpose.

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Thus, the Applicants submit that claim 13 is patentable over *Sugiyama* in view of *Zhong*. Accordingly, the Applicants respectfully request the rejection be withdrawn and the claims allowed.

B. Claim 14

Claim 14 stands rejected as being unpatentable over *Sugiyama* in view of United States Patent No. 3,934,061, issued January 20, 1976, to Keck et al. (hereinafter *Keck*). In light of amended claim 1, the Applicants respectfully disagree.

As discussed above, amended claim 1, from which claim 14 depends, recites limitations not taught or suggested by *Sugiyama*. As also discussed above, *Sugiyama* may not be modified in a manner that would yield the invention as recited in claim 1, as any such modification would render *Sugiyama* unsuitable for its intended purpose.

Moreover, *Keck* fails to teach or suggest depositing a core material on said first insulating layer to fill said opening, wherein said core material contacts said semiconductor layer along a side of said opening, as recited by claim 1. Thus, *Keck* cannot be used to modify *Sugiyama* in a manner that would yield the invention as recited in claim 1. As such, a *prima facie* case of obviousness has not been established since the combination of the cited art fails to teach or suggest all of the limitations recited in claim 1.

Thus, the Applicants submit that claim 14 is patentable over *Sugiyama* in view of *Keck*. Accordingly, the Applicants respectfully request the rejection be withdrawn and the claim allowed.

C. Claim 5

Claim 5 stands rejected as being unpatentable over *Sugiyama* in view of United States Patent No. 6,282,358, issued August 28, 2001, to *Hornbeck* et al. (hereinafter *Hornbeck*). In light of amended claim 1, the Applicants respectfully disagree.

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As discussed above, amended claim 1, from which claim 5 depends, recites limitations not taught or suggested by *Sugiyama*. As also discussed above, *Sugiyama* may not be modified in a manner that would yield the invention as recited in claim 1, as any such modification would render *Sugiyama* unsuitable for its intended purpose.

Moreover, *Hornbeck* fails to teach or suggest depositing a core material on said first insulating layer to fill said opening, wherein said core material contacts said semiconductor layer along a side of said opening, as recited by claim 1. Thus, *Hornbeck* cannot be used to modify *Sugiyama* in a manner that would yield the invention as recited in claim 1. As such, a *prima facie* case of obviousness has not been established since the combination of the cited art fails to teach or suggest all of the limitations recited in claim 1.

Thus, the Applicants submit that claim 5 is patentable over *Sugiyama* in view of *Hornbeck*. Accordingly, the Applicants respectfully request the rejection be withdrawn and the claim allowed.

D. Claims 9-12, 15, and 22-25

Claims 9-12, 15, and 22-25 stand rejected as being unpatentable over *Sugiyama*. In light of amended claim 1 and claims 22-25, the Applicants respectfully disagree.

As discussed above, amended claim 1, from which claims 9-12 and 15 depend, recites limitations not taught or suggested by *Sugiyama*. As also discussed above, *Sugiyama* may not be modified in a manner that would yield the invention as recited in claim 1, as any such modification would render *Sugiyama* unsuitable for its intended purpose.

Independent claims 22-25 each recite depositing a core material on said first insulating layer to fill said opening, wherein said core material contacts said semiconductor layer along a side of said opening. As such, claims 22-25 each recite limitations not taught or suggested by *Sugiyama*. In addition, as discussed above with respect to claim 1, *Sugiyama* may not be modified in a manner that would yield the invention as recited in any of claims 22-25, as any such modification would render *Sugiyama* unsuitable for its intended purpose.

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As such, a *prima facie* case of obviousness has not been established since the *Sugiyama* in combination with the ordinary skill in the art fails to teach or suggest all of the limitations recited in claims 1 and 22-25.

Thus, the Applicants submit that claims 9-12, 15, and 22-25 are patentable over *Sugiyama*. Accordingly, the Applicants respectfully request the rejection be withdrawn and the claims allowed.

### **CONCLUSION**

Thus, the Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and swift passage to issue are earnestly solicited.

If the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Keith Taboada at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

Oct 29, 2004



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